REMARKS

Claims 1-41 stand rejected on prior art grounds. Claims 7, 14, 19, 26, 33, and 40 stand rejected upon informalities. Applicants respectfully traverse these rejections based on the following discussion. Claims 6, 10, 13, 19, 22, 26, 33 and 39 are canceled herein. Thus, claims 1-5, 7-9, 11-12, 14-18, 20-21, 23-25, 27-32, 34-38 and 40-41 are all the claims presently pending in the application.

I. The 35 U.S.C. §112, Second Paragraph, Rejection

Claims 7, 14, 19, 26, 33, and 40 stand rejected under 35 U.S.C. §112, second paragraph, for failing to particularly point out and distinctly claim the subject matter of the invention. These dependent claims as well as their respective independent claims are amended herein to over come the rejection. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

II. The Prior Art Rejections

Claims 1-41 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kipersztok, et al., (U.S. Patent No. 6,574,537), hereinafter referred to as Kipersztok, in view of Ridolfo, et al. (U.S. Publication No. 2003/0005486), hereinafter referred to as Ridolfo. Applicants respectfully traverse these rejections because neither Kipersztok, nor Ridolfo teach several of the patentable features of the invention.

Specifically, neither Kipersztok, nor Ridolfo teach or suggest the following patentable features of independent claim 1 or the same or similar features of independent

claims 8, 15, 20, 27, 34, and 41: (1) "determining a number of prior failures for said item of equpiment;" (2) "if no selection from said list of common problems and said component hierarchy is received from said user, providing said user with a plurality of statistical failure values and historic repair information for all major components related to all common problems; and if a selection of at least one of a common problem from said list and a component from said component hierarchy is received from said user, providing said user with a plurality of statistical failure values and historic repair information for only selected components and components related to selected problems," and (3) "wherein if said item of equipment has at least a predetermined number of said prior failures, then said historic repair information provided to said user is for said item of equipment alone and wherein if said item of equipment has less than said predetermined number of said prior failures, then said historic repair information provided to said user is for said item of equipment and for other same type items of equipment."

Neither Kipersztok, nor Ridolfo teach or suggest the following patentable features of independent claim 8 or the same or similar features of independent claims 15 and 20 of: (1) "wherein said historic repair information provided to said user comprises all successful repairs and any comments regarding unsuccessful repairs" and (2) "wherein said statistical failure values comprise the number of failures, the probability of failure, the mean time between failures, the occurrence of the most recent failure, and the next expected failure."

Neither Kipersztok, nor Ridolfo teach or suggest the patentable feature of independent claim 20 of "wherein said statistical failure values are calculated based on

successful repairs and not on unsuccessful repairs". Similarly, neither Kipersztok, nor Ridolfo teach or suggest the patentable feature of independent claim 15 of "wherein the mean time between failures is calculated by ignoring repairs where the same problem occurred within a predetermined time of the most recent failure".

More particularly, the present invention teaches a system and method that uses a plurality of statistical failure values and repair histories to predict the likely cause of a current failure (see paragraph [0015-0016]). The system includes a database that stores data on various items of equipment including component hierarchies, failure descriptions, common problems, actions and processes used to repair the components, etc. (see paragraph [0015]). The system receives information from a user after an item of equipment is repaired and stores that historic repair information in the database (see paragraph [0019]). The invention further calculates and stores statistical failure values (e.g., number of failures, probability of failure, mean time between failures, occurrence of most recent failure, next expected failure, etc.) for each component of each item of equipment (see paragraph [0019-22]). Such calculations can be accomplished periodically, each time a repair is entered, each time an inquiry is made, etc. The invention further calculates these statistical values, including the mean time between failures, by using successful repairs and ignoring unsuccessful repairs (e.g., by ignoring repairs that were effected within a predetermined time prior to the most recent failure for the same problem and component set) (see paragraphs [0019-0020]). The information stored in the database can then be retrieved and processed in different ways (see paragraph [0019]).

For example, the system can receive an identification for an item of equipment (i.e., a tool) that needs repair (see paragraph [0018]). The user is provided with a list of common problems and a component hierarchy for that item of equipment (see paragraph [0024]). A determination is also made as to what the number of prior failures for that item of equipment (i.e., that tool) is and whether that number is statistically significant (i.e., whether the number is ≥ or < a predetermined number) (see paragraph [0024 and 0026]). Then, depending upon on whether a selection is made by the user, whether the selection is of a component, a problem or both, and whether the number of prior failures for the item of equipment is a statistically significant number, the system will respond differently (see paragraphs [0024-0027]).

That is, once the user is presented with the list of problems and component hierarchy, the user can select one or more common problems that describes the current failure and/or one or more specific components from the component hierarchy (e.g., in a suspect area) (see paragraph [0023]). The user may also make no selection at all (see Abstract and paragraph [0024]). The system responds differently depending upon whether a selection is made or not and if a selection is made, whether the selection is of a problem, a component or both (see paragraph [0024]). Specifically, if no selection is made (i.e., no component or problem is selected), the system provides the user with detailed information, including a plurality of statistical failure values and historic repair information, regarding all major components for all common problems. If a selection includes a component and no common problem, the system provides the user with detailed information that matches the selected component without regard to a problem. If

a selection includes a common problem and no component, the system provides the user with detailed information regarding components related to that selected problem.

The system also responds differently depending upon the number of prior failures. Specifically, the information that is provided to the user includes a plurality of statistical failure values (e.g., the number of failures, the probability of failure, the mean time between failures, the occurrence of the most recent failure, the next expected failure, etc.) and historic repair information (see paragraphs [0016], [0022] and [0030]). The historic repair information can include detailed information regarding successful repairs and also information and any comments regarding unsuccessful repairs (see paragraph [0022] and [0028]). However, if the number of prior failures is at least a predetermined number (i.e., a statistically significant number), then the historic repair information provided to the user is for that particular item of equipment only (see paragraphs [0026-27]). Whereas, if the number of prior failures is less than the predetermined number (i.e., not statistically significant), then the historic repair information provided to the user is for that item of equipment as well as for other same type items of equipment (see paragraphs [0026-0027]).

A. The cited prior art references do not teach or suggest the feature of "determining a number of prior failures for said item of equipment". (See independent claims 1, 8, 15, 20, 27, 34, and 41).

B. The cited prior art references do not teach or suggest that the user is provided with different information (including a plurality of statistical failure values and historic repair information) depending upon whether or not a selection of a problem and/or

component is made by the user. (See independent claims 1, 8, 15, 20, 27, 34, and 41). Specifically, the cited prior art references do not teach or suggest the feature of "if no selection from said list of common problems and said component hierarchy is received from said user, providing said user with a plurality of statistical failure values and historic repair information for all major components related to all common problems; and if a selection of at least one of a common problem from said list and a component from said component hierarchy is received from said user, providing said user with a plurality of statistical failure values and historic repair information for only selected components and components related to selected problems".

The Office Action cites Kiperstok as teaching "providing a user with a list of common problems (C1-18 especially "list of possible symptoms" C14:35-62) for same type items. The Applicants respectfully disagree. Col. 14, lines 36-41 and the associated figure (Figure 5D) refer to a method step in Kipersztok in which after a specific item of equipment (an aircraft) is identified by an identification number (see col. 14, lines 26-35), the mechanic inputs all observed symptoms (e.g., indicator lights on or off) for that aircraft into the system either directly or by selecting from a list of possible symptoms only. Once all of the observed symptoms are identified, the diagnostic model is executed and the user is then provided with a prioritized list of suspect components (see col. 14, lines 63-66) that may cause those symptoms. However, a "symptom" is not the equivalent of a problem, but rather is generally understood to be "an indicator of something" (see *The American Heritage® Dictionary of the English Language, Fourth Edition, ©2000*), such as a problem. Additionally, a list of "possible" symptoms is not

the equivalent of a list of "common" symptoms. The term common is generally understood to mean "occurring frequently" or "usual" (see *The American Heritage® Dictionary of the English Language, Fourth Edition, ©2000*). A list of "possible" symptoms is not limited to only those that occur frequently or are usual. Thus, the Applicants submit that Kipersztok does not teach the feature of providing a list of common problems and the Office Action acknowledges that Kiperstok does not teach the feature of providing the user with a component hierarchy. Without such a list and a component hierarchy, the "selection" of the present invention necessarily can not be made or not made.

Furthermore, in Kipersztok the user must select symptoms in order to receive a prioritized list of suspect components, as determined by a processing element (see Figure 6). The prioritized list is based on probability of failure determinations made by the processing element (see column 12, lines 42-56). The display of the prioritized list may include an indication as to the relative failure probabilities of the listed components (see Figure 6 and col. 15, lines 14-18). However, no where in Kipersztok does it disclose providing the actual failure probabilities or other statistical failure values to the user. Upon receiving the list of suspect components, the user decides which component in the list to repair/replace. This decision is based on how the components are prioritized within the list and/or on additional testing of one or more of the listed components (see Figure 6). The system of Kipersrsztok further allows the user to search a database for textual data (e.g., manuals or schematics, see col. 13, lines 59-68) regarding a component on the list of suspected components. However, no where in Kipersztok does it disclose

that the user can select component(s) from the list or opt not to select any components in order to receive both statistical failure values and historic repair information for all components or selected components, respectively.

The Office Action also cites Ridolfo as teaching the feature of providing said user with a list of common problems and a component hierarchy for same type items. However, the Ridolfo system is a health monitoring system, not a diagnositic system. Ridolfo does not specifically comprise "providing" (i.e., furnishing or supplying (see *The American Heritage® Dictionary of the English Language, Fourth Edition, ©2000*)) the user with a component hierarchy and list of common problems in response to receiving an item of equipment identification. Rather the system of Ridolfo simply allows a user to drill down through lists of various components and sub-components of an entire plant, before reaching a list of possible faults related to a specific sub-component of the plant and allowing the user to link via tabs to additional pages of information regarding that sub-component (e.g., state probability pages, historical data pages, maintenance logs pages, etc.) (see Figures 4-13). This allows the user to access the current health status of any of the component or sub-components of a plant. However, if no selection of a component is made by a user, the Ridolfo system will not respond by providing information.

C. The cited prior art references do not teach or suggest that the user is provided with historic repair information for the specific item of equipment or for both the specific item of equipment and same type items of equipment, depending upon whether or not the item of equipment has at least a predetermined number of prior failures or less than the

predetermined number of prior failures. As mentioned above, neither Kipersztok nor Ridolfo disclose determining the number of prior failures for the specific item of equipment being looked at. Additionally, the cited prior art references do not teach or suggest the feature of "wherein if said item of equipment has at least a predetermined number of said prior failures, then said historic repair information provided to said user is for said item of equipment alone and wherein if said item of equipment has less than said predetermined number of said prior failures, then said historic repair information provided to said user is for said item of equipment and for other same type items of equipment". (See independent claims 1, 8, 15, 20, 27, 34, and 41).

Specifically, while Kipersztok does disclose documenting repair/replacement activity in a maintenance log for a specific item of equipment (i.e., a specific aircraft) following a repair, no where in Kipersztok does it disclose "providing" information contained in the maintenance log for that specific item of equipment, much less for other same type items of equipment (i.e., other same type aircrafts), to the user, depending upon the number of prior failures for the item of equipment. Similarly, while Ridolfo does allow the user to access the maintenance logs for specific components or sub-components of an item of equipment (i.e., a plant) through the selection of a series of drill downs and tabs, no where in Ridolfo does it disclose "providing" maintenance information for both the item of equipment and for other same type items of equipment (i.e., same type plants) to the user (see Figures 6-9) if the number of prior failures for the item of equipment is less than a predetermined number.

D. The cited prior art references also do not teach or suggest that the information

provided to the user includes both statistical failure values and historic repair information and that the statistical failure values comprise the number of failures, the probability of failure, the mean time between failures, the occurrence of the most recent failure, and the next expected failure. (See independent claims 8 and 15, 20,).

As mentioned above, the user of Kipersztok does not receive both a plurality of statistical failure values and historic repair information in response to a selection of one of the components on the list. While Kipersztok (columns 11-12) mentions that a processing element can implement a bayesian network to identify component failure probabilities (e.g., based on observed meantime between failures) in order to prioritize a list of suspect components provided to the user, it does not disclose providing the user with any statistical value other than relative probabilities of failure of the components listed (see col. 13, lines 9-19). Furthermore, while Ridolfo teaches providing the user with access to predicted failure information and/or maintenance information (see Figures 6-9 and the associated text), the predicted failure probabilities of Ridolfo only include "failure state probability" (i.e., membership in one of several pre-defined failure domains indicating low to high probability of a failure occurring, see paragraph [105]). Neither Kipersztok, nor Ridolfo, disclose providing the user with the number of failures, the probability of failure, the mean time between failures, the occurrence of the most recent failure, and the next expected failure for selected components or components related to selected problems.

E. Similarly, the cited prior art references do not teach or suggest that the historic repair information provided to the user comprises all successful repairs and any

comments regarding unsuccessful repairs. (See independent claim 8, 15 and 20).

As mentioned above, while Kipersztok does disclose documenting repair/replacement activity in a maintenance log, no where in Kipersztok does it disclose that the information contained in the maintenance log indicates whether the actions taken (i.e., repairs made) were successful or unsuccessful or whether the maintenance log is ever provided to the user. Similarly, while Ridolfo provides a link to a maintenance log upon selection of a particular component, no where in Ridolfo does it disclose that the log contains information regarding the success or failure of the actions taken (see Figure 11).

F. The cited prior art references do not teach or suggest the features of "wherein said statistical failure values are calculated based on successful repairs and not on unsuccessful repairs" (see independent claim 22) or "wherein the mean time between failures is calculated by ignoring repairs where the same problem occurred within a predetermined time of the most recent failure" (see claim 15).

As mentioned above Kipersztok (columns 11-12) mentions that a processing element can implement a bayesian network to identify component failure probabilities (see col. 13, lines 9-19). Kipersztok further discloses that the probabilities are assigned based on factual information, systemic information and/or experiential information (see col. 13, lines 5-10). However, no where in Kiperstok does it disclose that the probabilities are based on successful repairs and not unsuccessful repairs. For example, Kipersztok discloses that failure probabilities can be derived from observed meantime between failures but does not limit the calculation of mean time between failures by ignoring repairs where the same problem occurred within a predetermined time of the

most recent failure. Furthermore, the Ridolfo probability values are predictive, not diagnostic. That is, in Ridolfo statistical methods are used for predicted component health, not to diagnose a failure and these values are based on various analyses (see paragraphs [0058-0059]), such as vibration analysis, temperature measurement, valve analysis, etc. (see paragraphs [0060-0083]), without reference to repairs and mean time between failures.

Therefore, independent claims 1, 8, 15, 20, 27, 34, and 41 are patentable over Kipersztok in view of Ridolfo. Further, dependent claims 2-5, 7, 9, 11-12, 14, 16-18, 21, 23-25, 28-32, 35-38 and 40 are similarly patentable, not only by virtue of their dependency from a patentable independent claim, but also by virtue of the additional features of the invention they define. Moreover, the Applicants note that all claims are properly supported in the specification and accompanying drawings, and no new matter is being added. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

II. Formal Matters and Conclusion

With respect to the rejections to the claims, the claims have been amended, above, to overcome these rejections. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections to the claims.

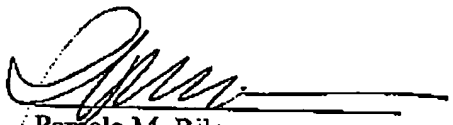
In view of the foregoing, Applicants submit that claims 1 claims 1-5, 7-9, 11-12, 14-18, 20-21, 23-25, 27-32, 34-38 and 40-41, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for

allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,

Dated: 10/4/06



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